FCC ID: NUOUSB41T

EMC

TEST REPORT

REPORT NO. : F87042204
MODEL NO. : UT-USB41T
DATE OF TEST : May 7, 1998

PREPARED FOR : UNIXTAR TECHNOLOGY, INC.

ADDRESS : 3F, 3, LANE 538, CHUNG CHENG RD.,
HSIN TIEN, TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

TABLE OF CONTENTS

1. CERTIFICATION

Issue Date: June 15, 1998

Product	:	USB HUB
Trade Name	:	UNIXTAR
Model No.	:	UT-USB41T
Applicant	:	UNIXTAR TECHNOLOGY, INC.
Standard	:	FCC Part 15, Subpart B, Class B
		ANSI C63.4-1992
		CISPR 22: 1993 +A1+A2
		ET Docket No. 95-19 (DoC Procedure)

We hereby certify that one sample of the designation has been tested in our facility on May 7, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

TESTED BY: Johnny Liu , DATE: 6/15/98
(Johnny Liu)

CHECKED BY: Sharon Hsiung , DATE: 6/15/98
(Sharon Hsiung)

APPROVED BY: Mike Su , DATE: 6/15/98
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	USB HUB
Model No.	:	UT-USB41T
Power Supply Type	:	DC (from adapter)
Power Cord	:	Nonshielded (AC, 1.8m)
		Nonshielded (DC, 1.5m)
Data Cable	:	Shielded (1.5m)

Note: The EUT is a medium-speed and standalone universal serial bus (USB) HUB. It supports four downstream ports and one upstream port.

The EUT was tested with a 2-pin UNIXTAR AC power adapter, model: MW48-0751000U and its rating is: Input: 230Vac, 50Hz,
Output: 7.5Vdc, 1A, 7.5 VA

For more detailed features, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.

2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	HP	D5220B	DoC approved	Nonshielded Power (1.8m)
2	COLOR MONITOR	ADI	PD-959	FCC DoC approved	Shielded Signal (1.2m) Nonshielded Power (1.8m)
3	PRINTER	HP	C2145A	B94C2145X	Shielded Signal (1.2m) Nonshielded Power (1.9m)
4	KEYBOARD	FORWARD	FDA-104GS	F4ZDA-104G	Shielded signal (1.2m)
5	CCD CAMERA	COMPAQ	YC72-CPQ	EDUYC72-CPQ	Shielded signal (2m)
6	MODEM	DATATRONICS	1200CK	E2O5OV1200CK	Shielded signal (1.2m) Nonshielded Power (1.9m)
7	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)

Note: 1. Three USB cables (2m) were connected to three USB ports of EUT to form three open loop cables.
2. Support unit 5 was connected to the fourth USB port of EUT.

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site. Please refer to the photos of test configuration in Item 5.

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated until
HP Spectrum Analyzer	8590L	3544A00941	Dec. 14, 1998
HP Pre-Amplifier	8447D	2944A08312	Sept. 10, 1998
R&S Receiver	ESVS10	844591/010	Sept. 23, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6111A	1500	Sept. 12, 1998
EMCO Turn Table	1060-04	1196	N/A
EMCO Tower	1051	1264	N/A
Open Field Test Site	Site 1	ADT-R01	Sept. 5, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 23, 1998
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 24, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	Aug. 1, 1998
EMCO-L.I.S.N.	3825/2	9204-1964	July 22, 1998
Shielded Room	Site 2	ADT-C02	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) dBuV/m	Class B (at 10m) dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission)
		30 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	24 ℃
Humidity	:	63 %
Atmospheric Pressure	:	1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -12.6 dB at 0.222 MHz Minimum passing margin of radiated emission: -2.1 dB at 216.01 MHz

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. CCD camera captures images and sends video messages to monitor via EUT.
5. PC sends "H" messages to monitor. Monitor displays "H" patterns and video messages simultaneously on screen.
6. PC sends "H" messages to modem.
7. PC sends "H" messages to printer, and the printer prints them on paper.
8. Repeat steps 3-8.

4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **USB HUB** MODEL: **UH4100K**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: Johnny Liu

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.189	50.70	-	51.10	-	64.08	54.08	-13.4	-	-13.0	-
0.222	48.30	-	50.10	-	62.74	52.74	-14.4	-	-12.6	-
0.280	45.20	-	46.90	-	62.52	52.52	-17.3	-	-15.6	-
0.686	35.60	-	41.00	-	56.00	46.00	-20.4	-	-15.0	-
1.372	32.60	-	34.30	-	56.00	46.00	-23.4	-	-21.7	-
7.197	24.80	-	23.80	-	60.00	50.00	-35.2	-	-36.2	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
4. The emission level of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

4.3 TEST DATA OF RADIATED EMISSION

EUT: **USB HUB** MODEL: **UH4100K**

ANTENNA: CHASE BILOG 6111A POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: Johnny Liu

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
48.02	12.0	13.0	25.0	30.0	-5.0
84.00	9.6	8.9	18.5	30.0	-11.5
107.98	12.9	12.0	24.9	30.0	-5.1
132.01	14.7	8.8	23.5	30.0	-6.5
144.01	14.2	9.4	23.6	30.0	-6.4
168.02	12.2	3.7	15.9	30.0	-14.1
192.02	12.4	10.8	23.2	30.0	-6.8
204.01	13.0	8.8	21.8	30.0	-8.2
216.03	14.2	9.9	24.1	30.0	-5.9
228.03	15.3	6.3	21.6	30.0	-8.4
240.02	16.5	8.0	24.5	37.0	-12.5
288.02	17.0	6.0	23.0	37.0	-14.0

REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) +Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

FCC ID: NUOUSB41T

TEST DATA OF RADIATED EMISSION

EUT: **USB HUB** MODEL: **UH4100K**

ANTENNA: CHASE BILOG 6111A POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: Johnny Liu

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
48.01	11.7	16.0	27.7	30.0	-2.3
72.01	7.6	8.6	16.2	30.0	-13.8
120.01	15.4	7.4	22.8	30.0	-7.2
132.01	16.5	8.3	24.8	30.0	-5.2
144.01	16.5	10.2	26.7	30.0	-3.3
168.02	13.1	7.0	20.1	30.0	-9.9
192.02	13.3	14.2	27.5	30.0	-2.5
204.01	14.0	13.4	27.4	30.0	-2.6
216.01	14.6	13.3	27.9	30.0	-2.1
228.01	15.3	7.7	23.0	30.0	-7.0
240.02	15.9	9.4	25.3	37.0	-11.7

REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) +Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT

Specifications:

● Weight	150g
● Dimension	140x75x29mm
● Enclosure	Plastic (ABC V0)
● Connector	Four "A Type" and one "B Type"
● Power Adapter	DC 7.5V/2A
● Operating temperature	0℃ to 70℃
● Storage temperature	-40℃ to 70℃
● Operation Humidity	10% to 80%
● Storage Humidity	5% to 90%